SITE CHARACTERIZATION GUIDELINES

Prior to conducting Site Characterization work, the Initial Site Characterization Work Plan must be approved and a Site Characterization Permit issued by the Long Beach Department of Health and Human Services, Division of Hazardous Materials.

The purpose of the Site Characterization includes:

1. Identifying the discharged waste.
2. Defining the horizontal and vertical extent of the contamination.
3. Determining whether ground water or surface waters have been impacted.

The following documents (A-D) will be required for submittal:

A. Site Characterization Permit Application (Attachment I) signed by the property owner or operator.
B. Completed UST Unauthorized Release (Leak)/Contamination Site Report.
C. Initial Site Characterization Work Plan with Proof of Qualification.
D. Final Site Characterization Report upon completion of Site Characterization.

All correspondences should be submitted to: *Long Beach Department of Health & Human Srvs*
Division of Hazardous Materials
2525 Grand Avenue, Suite 222
Long Beach, CA 90815
Phone: (562) 570-4131

A permit fee of $ 235.00 has been established for the Site Characterization project review. Where review exceeds three hours of staff time, an additional hourly fee will be assessed.

PROOF OF QUALIFICATION*

- Demonstrate adequate experience in performing site characterization/site remediation.
- Document appropriate education and professional certification in area of expertise.
- List the equipment you required to conduct the project.
- Provide a copy of a current Long Beach Business License.

* Proof of Qualification will be kept on file for one year by Long Beach Department of Health and Human Services.

Any person, firm or corporation involved in Site Characterization must be qualified to do the work. The Work Plan/report must be signed by an independent California Registered Geologist, a California Certified Engineering Geologist, a California Registered Geotechnical Engineer or a California Registered Civil Engineer with sufficient experience in soils.

You should also be aware of the South Coast Air Quality Management District's Rule 1166 regarding volatile organic compound (VOC) emissions from contaminated soil. If you are going to treat or handle VOC-contaminated soil, you must notify the South Coast Air Quality Management District Executive Officer by telephone within 24 hours of detection of the VOC-contaminated soil and comply with those requirements.

I. SITE CHARACTERIZATION PERMIT APPLICATION

Documents submitted at time of application

- Completed Permit Application (Attachment I), signed by the property owner or operator.
- Initial Site Characterization Work Plan.
- UST Unauthorized Release (Leak)/Contamination Site Report.
- Permit fee of $235.00. (Make checks payable to City of Long Beach DHHS).

II. INITIAL SITE CHARACTERIZATION WORK PLAN

The Initial Site Characterization Work Plan must include but is not limited to the following items: (**Work Plans that do not follow this format will be rejected**).

1. **Site Information**

   Characterize past and present activities at the site including:
   a. List any previous businesses at the site.
   b. Describe storage, handling, use and disposal procedures for all chemicals and petroleum products.
   c. Provide name, address, and telephone number of the property owner and any landlord/lessor and lessee.
   d. Summarize the site history relative to all contamination in question.
   e. Justify the need for all assessment activities, and indicate any proposed future uses of the area relative to the contamination.
   f. Describe the surrounding community.

2. **Facility Map**

   Include the following in relation to the subject site:
   a. Site boundaries, including adjacent streets.
   b. Location of all potential sources of contamination, past and present, including:
      [1] Chemical manufacturing and storage areas

[2] Transfer and use areas
[3] Underground tanks and associated piping
[4] Clarifiers, sumps and pits

c. Location of surface and subsurface structures.
d. Proposed boring/sampling locations.
e. Location of all hand samples taken during any tank excavation.
f. Location of any previous site assessment work.
g. Scale.
h. North arrow.
i. Index map.
j. Name and address of facility.
k. Name and address of person/ firm preparing the map.

3. Hydrogeology

Based on review of existing information, literature and records, describe the regional hydrogeologic setting, in reference to the following, for the subject site (list all reference sources):

a. Site-specific depth to groundwater.
b. Pressure cells.
c. Groundwater basins.
d. Depositional basins and stratigraphy.
e. Formations and members.
f. Surficial deposits.
g. Aquifer systems.
h. Local search of well records in all jurisdictions.
i. Local uses of groundwater.
j. Nearby wells that may be adversely impacted.
k. Perched water tables.

4. Screening Procedures

One or more of the following screening procedures may be utilized to determine future site assessment boring locations:

a. Soil gas survey.
b. Hydropunch.
d. Piezometer.
e. Boring soil excavation samples screened with:
[1] GC-PID gas chromatograph with a photoionization detector.
[2] GC-FID flame ionization detector. (This is not sensitive to BTXE, but is the detector of choice for determination of methane, some hydrocarbons, fuels and solvents such as ethers and glycols).

(Field-meter readings are acceptable as field-screening techniques. However, readings must be supported with soil/core sample analysis in the final report. All calibration of field instruments must be performed in the field).

5. **Plume Definition**

Provide rationale for the number, location and depth of proposed borings, including reasons for proposed depth of each boring, if less than 40 feet.

6. **Encountering Groundwater**

If groundwater is encountered during soil borings, document the depth at which it is encountered and any other relevant hydrogeological data or lithological descriptions.

Provide a contingency plan for conversion of borings that encounter saturated zones to groundwater sampling wells in the event that further sampling is required by the Regional Water Quality Control Board. ***(If groundwater contamination is discovered, the site will be referred to the Regional Water Quality Control Board for oversight.)*** The contingency plan should include permitting and well design, construction, and development specifications.

7. **Soil Boring/Water Well Permits**

The drilling of soil borings/water wells requires a permit from the Long Beach Department of Health and Human Services. (Application for this permit is available via website: www.lbpublichealth.org/haz_home.html (Click Link for Forms) or by calling (562) 570-4134.

8. **Soil Cuttings and/or Purged Water Disposal**

Contaminated soil cuttings or purged water generated during the drilling of bore holes must be legally transported to an appropriate landfill, treatment facility or stored in a secure manner if they are to be mitigated in conjunction with the site remediation.

9. **Sampling Plan**

Provide a sampling plan that includes the locations and number of samples to be taken and analyzed.

Soil samples should be taken from the borings at consistent intervals of five feet to develop a complete profile of the soil contamination. If a dissimilar layer of soil is found to exist entirely between the five feet sampling intervals, a sample from this layer shall also be taken and analyzed.

a. Underground Storage Tanks (USTs): Samples are to be collected using a volumetric sampling system designed to collect, store and deliver a soil sample as specified in USEPA SW-846 version III 12/1996. Apply EPA Method 5035 for soil sampling and preservation to minimize volatile organic losses. A minimum of three borings must be taken below or adjacent to each tank or the area previously occupied by each underground tank, or below and adjacent to the area otherwise contaminated. These borings shall be used for soil sampling to check for lateral as well as vertical

movement of contaminants in the soil. Additional borings may be necessary in some cases. The borings shall extend through the entire depth of contaminated soil. All abandoned boreholes shall be sealed with appropriate grout formulations.

b. Non-UST Related Projects (Phase II Site Mitigation, clarifiers, or hydraulic lifts): Stainless steel or brass sleeves may be used to obtain soil samples.
Representative samples are to be taken subject to approval by this Department.

10. **Analytical Testing Requirements:**

TEST METHODS

PRODUCT or CONTAMINANT	E.P.A. TEST METHOD	
	SOIL	WATER
Gasoline BTXE and MTBE	8015(M) Carbon chain fingerprint 8260B	8015 Mod GC/FID Carbon chain fingerprint 602
Diesel fuel	8015(M) Carbon chain fingerprint 8260B	8015 Mod GC/FID Carbon chain fingerprint 602
Jet fuel	8015(M) Carbon chain fingerprint 8260B	8015 Carbon chain fingerprint
Waste motor oil	8015(M) Carbon chain fingerprint 8260B CAM Metals	8015 Carbon chain fingerprint 8260B CAM Metals
Solvent	Site Specific	Site Specific
Pesticides	Site Specific	Site Specific
Hydraulic Lift Vaults	8015(M) Carbon chain fingerprint 8260B CAM Metals	8015 Carbon chain fingerprint 8260B CAM Metals
Clarifiers	8015(M) Carbon chain fingerprint 8260B CAM Metals	8015 Carbon chain fingerprint 8260B CAM Metals
Above –Ground Petroleum Tanks	8015(M) Carbon chain fingerprint 8260B CAM Metals	8015 Carbon chain fingerprint 8260B CAM Metals
Unknowns	Site specific	Site specific

602 Aromatic volatile organics (water only)

8015(M) Non-halogenated volatile organics (modified) for fuel analysis using gas chromatography/flame ionization detection in field.
C_4 – C_{12} C_{13} -- C_{22} C_{23+}

REQUIRED MDL

ANALYTE	ANALYTICAL METHOD	SOIL (µg/kg)	WATER (µg/L)
BTEX	EPA Method 8260B(8021B)	2	1
MTBE	EPA Method 8260B	5	2
DIPE	EPA Method 8260B	5	2
ETBE	EPA Method 8260B	5	2
TAME	EPA Method 8260B	5	2
TBA	EPA Method 8260B	20	10
TPHg	EPA Method 8015(M)(8260B)	250-500	50-100
TPHd	EPA Method 8015(M)	2,500-5,000	500-1,000
Methanol	EPA Method 8015(M)	1,000	1,000
Ethanol	EPA Method 8015(M)(8260B)	1,000	1,000

MDL – minimum detection limits

Source: California Regional Water Quality Control Board, Los Angeles Region, UST Lab Requirements For Oxygenates (06/24/03)

11. **Sampling Protocol**

    Describe sampling protocol. Include procedures to prevent cross contamination.

12. **Testing Laboratory**

    Indicate name and address of the laboratory that will analyze samples obtained at the site. The testing laboratory must be certified by the California Department of Health Services' Environmental Laboratory Accreditation Program (ELAP). A list of ELAP certified laboratories is available at: www.dhs.ca.gov/elap.

13. **Provide assurance that all work will be done in accordance with all applicable local, State and Federal Laws and Regulations.**

14. **Health and Safety Plan.**

15. **Site Characterization Permit Application.**

16. **Permit fee payment of $ 235.00 (make checks payable to City of Long Beach DHHS).**

Once the Initial Site Characterization Work Plan has been approved, a Site Characterization Permit will be issued.

III. FINAL SITE CHARACTERIZATION REPORT

The Final Site Characterization Report must address all divergences from the Initial Site Characterization Work Plan and justify all changes.

The results of the Site Characterization shall be submitted in the Final Report, which will be reviewed in order to determine the completeness of the Characterization and the applicability of local, State and Federal Laws or Regulations that may require Site Remediation.

For non-UST projects, where a voluntary Phase II analysis has found contamination to exist, the Phase II findings may be accepted in lieu of the submittal of an initial Site Characterization Work Plan. Results of the Phase II findings may be submitted in a Final Site Characterization Report, which must include the information listed below.

Submittal of a Final Site Characterization Report from a Phase II analysis must be accompanied by a completed Permit Application and remittance of the $235.00 fee. (Make checks payable to City of Long Beach DHHS).

The following minimum information shall be contained in the Report:
(Reports that do not follow this format will be rejected.)

1. **Facility Map**

   Include the following in relation to the subject site:
   a. Site boundaries, including adjacent streets.
   b. Location of leaking underground tanks.
   c. Location of surface and subsurface structures.
   d. Boring/sampling locations.
   e. Locations of all hand samples taken during any tank excavations.
   f. Location of any previous site assessment work.
   g. Scale.
   h. North arrow.
   i. Index map.
   j. Name and address of the facility.
   k. Name of person/firm preparing the map.

2. **Sampling Procedures**

   Provide detailed description of the sampling procedures.

3. **Analytical Results**

   Provide all original laboratory results. In addition to the laboratory data, results shall be organized into a tabular display indicating sample identification number, laboratory analysis results, depth of samples, detection limits and appropriate action levels.

4. **Chain of Custody**

Provide chain of custody for samples including signatures for relinquishing and receiving of samples, sampling date and time, sample description, analytical methods requested, nature of sample, number, size and type of containers and correlation between field ID and laboratory ID Numbers.

5. **Soil Properties**

Determine soil properties that affect contaminant mobility in the vadose zone. Relate the specific residual contaminants with their potential long-term effect on groundwater.

6. **Aquifer Properties**

Determine specific aquifer properties for correct setting of monitoring well(s). Use of piezometer clusters is encouraged to ascertain aquifer properties.

7. **Boring Logs**

Provide complete and legible boring logs which shall include:

a. Description of earth materials.
b. Lithographic column with abbreviations and symbols.
c. Thickness of floating product.
d. Sample localities at depth.
e. Depth to the piezometric or groundwater surface.
f. Depths reported in feet.
g. Penetration in blows per foot.
h. Surface elevation in feet.
i. Project name.
j. Name of field geologist.
k. Boring number.
l. Termination depth in feet.
m. Scale.
n. Type of equipment and methods used.
o. Isolated lenses.

8. **Hydrogeologic Data**

This is to be used only as a guideline, and may include, but is not limited to the items listed below:

a. Address the hydrogeologic setting, cite all references, and include the following in reference to the subject site:
    [1] Pressure cells
    [2] Groundwater basins
    [3] Depositional basins and stratigraphy
    [4] Formation and members

[5] Surficial deposits
[6] Aquifer system

b. Address the site-specific hydrogeologic setting, cite all references, and include the following in reference to the subject site:
[1] Local search of well records in close proximity to the site.
[2] Identify local issues of groundwater.
[3] Local search of nearby contamination assessment reports.
[4] Groundwater features:
[a] Vadose zone.
[b] Saturated and unsaturated zones.
[c] Capillary fringe.
[d] Piezometric surface or water table level contours.
[e] Aquifers and aquicludes.
[f] Recharge and discharge sources.
[g] Representative transmissivities.
[5] Unique site features -
The physical characteristics of the site that could influence the movement and direction of contaminants through the surface.
[a] Earth materials contacts -
Contact lines between the items listed below:
(1) Faults, fractures and joints.
(2) Soil horizons.
(3) Bedrock materials.
(4) Weathered zones.
(5) Isolated lenses.
(6) Fill materials.
[b] Man-made conduit contacts -
Contact lines between the items listed below:
(1) Sewer line backfill.
(2) Utility trench backfill.
(3) Bedding material under footings.
(4) Wall backfill.
(5) Swales and berms.
(6) Surficial obstructions.
[6] Provide stratigraphic interpretation between well borings

c. Provide a plan view
[1] Depict the extent of contamination relative to all groundwater features and unique site features.
[2] Provide north arrow, scale, elevations, site boundaries, legend, trace of section lines and boring locations with representative contaminant concentrations.

d. Provide a cross-section
[1] Depict the vertical and horizontal extent of the contamination relative to all groundwater features and unique site features.

[2] Show interpolation between well borings.
[3] Provide direction of section lines, elevations, scale, legend and boring locations with representative contamination concentrations shown at depth.

e. Provide Supplemental Data
[1] Establish the site-specific hydraulic gradient, direction of groundwater flow, and the high water table level based on original field data.
[2] Resolve discrepancies between regional and local data, and cite all references for regional data.

f. Provide a complete index map that is clearly legible (preferably from "Thomas Guide").

g. Provide complete and legible boring logs which shall include the following:
[1] Description of all materials.
[2] Lithographic column with abbreviations and symbols.
[3] Thickness of floating product.
[4] Sample localities at depth.
[5] Depth to the piezometric or groundwater surface.
[6] Depths in feet.
[7] Penetration in blows per foot.
[8] Surface elevation in feet.
[9] Project name.
[10] Name of field geologist.
[11] Boring number.
[12] Termination depth in feet.
[13] Scale.
[14] Type of equipment and methods used.
[15] Isolated lenses.
[16] All borings for volatile and/or semi-volatile organic compounds must show the field meter screening readings, supported by core analysis.
[17] The termination of the boring depth must be established by non-detectable levels of contamination (by core analysis).
[18] Where groundwater proximity is close to the bottom of borings, a groundwater well must be installed and developed and the groundwater sampled and analyzed.

h. Provide piezometer and/or monitoring well construction detail(s) and procedure for installation.

9. **Soil and Water**

Provide documentation for proper disposal of soil and water generated during the drilling of borings and/or purging activities.

10. **Plume Illustration**

Depict the extent of all existing liquid-phase, adsorbed-phase, vapor-phase and/or dissolved-phase contaminant plumes.

11. **Conclusions and Recommendations**

Discuss and describe the distribution and concentration of hydrocarbon contamination and its relationship to the medium in which it occurs (soil and/ or water in the vadose zone, capillary fringe and saturated zone). Justify why it is believed the plume is defined.

Recommend additional site characterization or site remediation, as needed.

12. **Completed UST Unauthorized Release (Leak)/Contamination Site Report** (4 copies: white, green, yellow, and pink). This form may be obtained from the Long Beach Department of Health and Human Services.

ATTACHMENT I

CITY OF LONG BEACH DEPARTMENT OF HEALTH AND HUMAN SERVICES
LONG BEACH/SIGNAL HILL UNIFIED PROGRAM AGENCY

SITE CHARACTERIZATION PERMIT APPLICATION

SITE LOCATION:_____

_____

NAME OF BUSINESS:_____

NAME OF OWNER/OPERATOR:_____

TELEPHONE NUMBER:_____

MAILING ADDRESS:_____

CONTACT NAME IF DIFFERENT FROM OWNER/OPERATOR:_____

TELEPHONE NUMBER:_____

MAILING ADDRESS:_____
_____

NAME OF SELECTED ENVIRONMENTAL CONSULTANT:_____

TELEPHONE:_____

ADDRESS:_____
_____

Name of Owner/Operator approving Site Characterization project:_____

Signature:_____
Date:_____

This Section for official use

Assigned Hazardous Materials Specialist(s)_____
_____
Date when Permit Application was received:_____
Remarks:_____
_____
_____